National Institute of Environmental Health Sciences

Distributions of pharmaceuticals in an urban estuary during both dry- and wet-weather conditions

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Abstract:

Pharmaceuticals and selected major human metabolites are ubiquitous in Jamaica Bay, a wastewater-impacted estuary at concentrations in the low ng/L to low mu g/L range. Concentrations throughout the bay are often consistent with conservative behavior during dry-weather conditions, as evidenced by nearly linear concentration -salinity relationships. Deviation from conservative behavior is noted for some pharmaceuticals and attributed to microbial degradation. Caffeine, cotinine, nicotine, and paraxanthine were detected with the greatest analytical signal, although evidence is presented for in situ removal, especially for nicotine and caffeine. There is little evidence for significant removal of carbamazepine and sulfamethoxazole, suggesting they are more conservative and useful wastewater tracers. Immediately following heavy precipitation, which induced a combined sewer overflow (CSO) event, the concentrations of all compounds but acetaminophen and nicotine decreased or disappeared. This observation is consistent with a simple model illustrating the effect of precipitation has on pharmaceutical concentration in the wastewater stream, given the balance between dilution from rain and the bypass of treatment.

Source: http://dx.doi.org/10.1021/es0629965

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Extreme Weather Event, Food/Water Quality

Extreme Weather Event: Flooding

Food/Water Quality: Chemical

Geographic Feature:

resource focuses on specific type of geography

Freshwater, Ocean/Coastal

Geographic Location:

resource focuses on specific location

United States

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content